ILLINOIS SUSTAINABLE TECHNOLOGY CENTER
PRAIRIE RESEARCH INSTITUTE

Projects on Biodiesel

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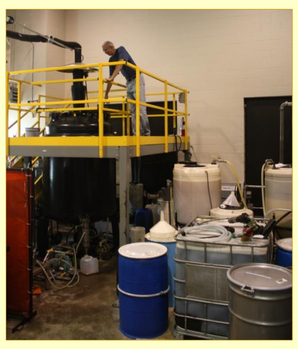
For more information on these projects mentioned here see the display case to the right.

McDonald's Waste Oil to Biodiesel

- This project was a collaboration between the Illinois Sustainable Technology Center (ISTC) and the McDonald's Corporation.
- ISTC conducted a waste oil to fuel demonstration project at McDonald's headquarters in Oakbrook, Illinois.
- ISTC collected waste vegetable oil from McDonald's test kitchens and produced biodiesel from the waste vegetable oil.
- The fuel was utilized by McDonald's Corporation for their diesel-powered shuttle vans, which are used to transport McDonald's personnel in the Chicago area from their different corporate locations.
- The initial demonstration project was conducted from March 1, 2007, to February 28, 2008.
- Further collaboration on testing of biodiesel fuels continued until April 30, 2012.



Jatropha Seeds to Biodiesel and Soap

- This project collaborates with Partners for People and Place (PPP) to produce biodiesel and soap from *Jatropha* plant seeds for the Haitian people.
- Haitian farmers grow the *Jatropha* plants; harvest the seeds; and sell the seeds to PPP at fair market value.
- PPP works with several non-for-profit organizations that make biodiesel and soap from the seed oil.
- Then those products are sold to the Haitian people.
- All the revenue stays in Haiti and the *Jatropha* plants help to restore deforested land to natural habitat.
- ISTC developed the first biodiesel pilot plant in Haiti and produced the first *Jatropha* biodiesel in 2010.
- Joe Pickowitz and ISTC conduct research to help make the biodiesel and soap-making processes more efficient and less costly.

Why *Jatropha?*

- Native perennial shrub/tree to Haiti
- Easily cultivated without irrigation or fertilization
- Grows on marginal land too dry or poor for food crops
- Adapted to grow in difficult places including arid and mountain slopes
- Inedible by goats and grazing animals
- Pest and disease resistant
- Reaches full seed production within three years
- Produces beans for 40-50 years
- Easily harvested by hand labor
- Yield: 1,590 Kg of *Jatropha* oil per hectare vs. 375 Kg of soybean oil per hectare

Top: first biodiesel pilot plant in Haiti
Left: *Jatropha* leaf, seedpods, and seeds
Right: *Jatropha* shrub/tree

U of I Dining Halls' Waste Oil to Biodiesel

- Illinois Biodiesel Initiative is an independent division of the U of I's Engineers without Borders group.
- Its main project, which started in 2005, is to collect waste vegetable oil from campus dining halls every week and convert it into biodiesel. It is estimated that about 600 to 800 gallons of oil and grease from the U of I is converted into biodiesel per month.
- This 100% biodiesel is being used to power a standard diesel Ford 250 pickup truck here at ISTC and also is sold to the U of I motor pool to use in university vehicles at ~25% blend.
- Chemical additives are mixed into the biodiesel to increase its performance in typical cold temperatures during Illinois' winters.
- The performance of the biodiesel under various conditions, as compared to traditional petroleum diesel, is monitored and modified to improve the production process.
- The by-product of the biodiesel production, glycerin, is also a viable resource and is being used in soap-making research.

Waste oil from U of I Dining Halls is deposited in 55 gallon barrels and then transferred to large carboys in a Facilities and Services truck for transport back to ISTC where the waste oil is turned into biodiesel and soap.

Soap from Glycerin, a Biodiesel Byproduct

- Members of the Soap Group, a part of the Illinois Biodiesel Initiative, are experimenting with recipes to create functional and marketable soap from glycerin, a by-product of the reaction that produces biodiesel.
- They are working to improve upon a sample of liquid dish soap that they gave to the Ikenberry Dining Hall earlier this year, as well as developing new soaps to sell to other outlets on campus.
- The soap helped clean the dishes, but it left behind a residue on the dishes and in the dishwashing machine.
- The group is addressing this concern by testing and reformulating batches of liquid soap and hope to have a new batch ready for the dining hall soon.
- The Soap Group is preparing other samples for university housing as part of a proposal to replace the hand soap in dormitory bathrooms with a product that is sustainably manufactured right on campus.